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## THE IMPATIENCE THEORY OF INTEREST

The re-presentation of Professor Irving Fisher's "Impatience Theory of Interest" in his *Elementary Principles of Economics*<sup>1</sup> is significant for several reasons. On the one hand, it indicates not only that the author still believes this theory to be logically complete and satisfactory but also that he deems it to be so firmly established among accepted economic principles as to be entitled to a prominent place in a book which "does not attempt . . . to introduce controversial matter,"<sup>2</sup> and which is designed for undergraduate instruction. On the other hand, the attempt to present the theory in elementary form inevitably exposes it more than ever to adverse criticism. The formidable array of rigid mathematical "proofs"<sup>3</sup> with which it was accompanied in his *Rate of Interest*<sup>4</sup> could not but be awe-inspiring, even when not convincing, to economists less accustomed to the use of mathematical symbols and modes of expression. To the extent that the latest formulation is clothed in a language that all may follow and understand, its merits and demerits stand out the more clearly and unmistakably. While this simplifies the task of the critic, the fact that a thinker of Fisher's acuteness adheres to his explanation shows criticism to be still important.

Professor Fisher's "Impatience Theory of Interest" is Professor von Böhm-Bawerk's "Discount Theory," with two highly important modifications. Fisher denies the validity of the distinction between land and capital (that is, "produced means to further production") and refuses to admit that what Böhm-Bawerk calls the "technical superiority of present over future goods" and what other writers have characterized more briefly as "the productivity of capital" has any influence on the comparison between present gratifications and future gratifications in which, as he believes, the complete and final explanation of interest is to be sought.

<sup>1</sup> The Macmillan Company, 1912. Two editions of this book were privately printed for experimental use before the final form now made public was decided upon.

<sup>2</sup> *Ibid.*, Preface, p. vii.

<sup>3</sup> For example the "Mathematical Refutation of Böhm-Bawerk's Claim as to Ground of Preference for Present over Future Investment of Labor" in the appendix to ch. 4 of *The Rate of Interest*, p. 354. Böhm-Bawerk pays his compliments to this unfortunate "refutation" in his usual trenchant manner in the latest edition of his *Positive Theorie des Kapitals*, pp. 361-381.

<sup>4</sup> The Macmillan Company, 1907.

For Fisher there is no logical ground for distinguishing between wealth that is capital and wealth that is not capital. Capital is any stock of wealth existing at a given instant of time.<sup>5</sup> It thus includes land as a gift of nature as well as the produced means to further production, to which other writers limit the conception. It also includes durable consumption goods. Finally, it includes the world's workers themselves since their powers and capacities are a part of the world's wealth. No definition of capital less broad than this, in Fisher's opinion, can furnish an adequate basis for the discussion of the problem of interest.

Starting from this all-inclusive conception of capital he finds that "the essence of interest is impatience, the desire to obtain gratifications earlier than we can get them, the preference for present over future goods."<sup>6</sup> This he considers "a fundamental attribute of human nature," and "as long as it exists," he maintains, "so long will there be a rate of interest." The degree of preference or the "rate of impatience" varies with different individuals and under different circumstances. His detailed explanation of the rate of interest consists in enumerating the causes of these variations and analyzing the process by which individual preference rates combine to determine the current rate in the manifold forms in which this appears and reappears in organized industrial society.

What are the sources of this "fundamental attribute of human nature"? Fisher finds them, on the one hand, in "personal characteristics of individuals" and, on the other, in characteristics of the incomes of individuals. The important personal characteristics are: (1) foresight, (2) self-control, (3) habit, (4) expectation of life, (5) love of posterity. Short-sighted, weak-willed persons, who are accustomed to spend, have not long to live, and are without heirs, have high impatience rates. On the other hand, far-sighted, self-controlled persons, who are accustomed to save, who look forward to long lives, and have children for whom to provide, have low impatience rates. But these high or low rates will be further modified by the expected incomes or "income streams" of persons of these diverse types. Their incomes may differ in amount, in distribution in time, and in certainty. In general, the larger and

<sup>5</sup> *Principles*, p. 38 *et seq.*; *Capital and Income*, ch. 4.

<sup>6</sup> *Principles*, p. 371. Most of the important elements in his explanation are contained in chs. 20-24 of his *Principles* and chs. 6-11 of his *Rate of Interest*.

the more certain the income the lower the impatience rate. But expected variations in the amount of the income will also have their influence. An income that is expected to contract in the future makes for a lower impatience rate; an income that is expanding, for a higher impatience rate. From these elements, each of which is explained and illustrated at some length, the diverse impatience rates of different individuals are said to be derived. The combination and interaction of these rates effected through borrowing and lending, spending and investing, establish the general impatience rate which we commonly term the rate of interest.

Most, if not all, of the considerations that enter into this analysis have been made familiar by other writers as factors bearing on the interest problem. Not to go farther, in my own discussion of the circumstances influencing the accumulation of capital in my *Introduction to Economics* I mention eight such factors: (1) provision for present and future needs ("amount of income"), (2) uncertainty of the future ("expectation of life" and "certainty of income"), (3) deficiency in imagination ("lack of foresight"), (4) lack of will-power ("self-control"), (5) desire to provide for old age and for the family ("expectation of life" and "love of posterity"), (6) desire for power, (7) desire for interest, (8) ambition for business success. I thus included all of Fisher's factors except "habit," which like most other writers I took for granted, and "distribution of income in time," about which I shall have something to say later. It is not, then, the factors which Fisher makes prominent as the causes of interest that distinguish his theory from other theories, but rather his method of presenting these factors and his denial of the pertinence of that other factor, the "technical superiority of present over future goods" or the "productivity of capital," which to other writers has seemed all important.

The most striking fact about his method of presenting his factors is that he dissociates his discussion completely from any account of the production of wealth. From a perusal of his *Rate of Interest* and of all but the very last chapters of his *Elementary Principles* (chapters which come *after* his discussion of the interest problem), the reader might easily get the impression that becoming rich is a purely psychological process. It seems to be assumed that income streams, like mountain brooks, gush spontaneously from nature's hillsides and that the determination of the rate of interest

depends entirely upon the mental reactions of those who are so fortunate as to receive them. While minute attention is given to the influence of the size, distribution in time, and certainty of income streams, practically nothing is said of the *why* of these income streams. The whole productive process, without which men would have no income streams to manipulate, is ignored, or, as the author would probably say, taken for granted. From Fisher's point of view this procedure is perfectly legitimate. He believes the determination of interest to be a psychological process and like Böhm-Bawerk he feels under obligation to bring in from the business world only the factors that influence preference rates. The all-important difference is that Böhm-Bawerk, with shrewd insight into the mental processes of business men, recognizes one of the important factors to be "the technical superiority of present over future goods" and, in order to give this its due weight, feels constrained to explain at length the important role which capital plays in production. By so doing Böhm-Bawerk renders the difference between his theory and the so-called productivity theory, when correctly stated, a difference mainly of terminology and emphasis. By denying the importance of the productivity aspect of capital, Fisher, on the other hand, has freed himself from the necessity of saying anything about the part capital plays in production. As a result we have an explanation of distribution as completely divorced from the explanation of production, as though incomes "just grew" and that was all there was for the interest theorist to say about them.

It would require much more than a single article to indicate all of the points in Fisher's explanation to which I cannot assent and the reasons for my disagreement. Böhm-Bawerk has devoted some fifty pages of the new edition of his *Positive Theorie*<sup>7</sup> to an attempt to demonstrate the irrelevance and inconclusiveness of one of Fisher's criticisms of his own explanation—that is, the importance he ascribes to the technical superiority of present over future goods. To attempt to answer all of Fisher's criticisms of other theories and at the same time to show the inadequacy and incompleteness of his theory, would necessitate a stout volume. There are certain aspects of the matter, however, that I believe can be made clear without venturing very far into the technicalities of a

<sup>7</sup> *Positive Theorie des Kapitals*, Dritte Auflage, 1912, Exkurs XII.

really adequate discussion and it is to these alone that I shall address myself.

The interest-determining factors which Fisher makes prominent affect personal rates of discount or "impatience rates," as he is careful to point out, quite unequally. Nevertheless he describes impatience for present gratifications as a "fundamental attribute of human nature" and in his *Rate of Interest* goes so far as to assert that<sup>8</sup> "the rate of interest in terms of money can never be negative." Neither of these positions seems to me to be well taken and for reasons that will serve very well to introduce more difficult aspects of the problem. Fisher says that a negative rate of money interest is impossible "because money possesses durability and may be hoarded without loss."<sup>9</sup> Granted; but is it not also true that money cannot be hoarded without trouble, expense, or risk, and that these are as effective causes of loss as would be the physical deterioration of the coins hoarded? So far as the abstract question is concerned his *a priori* argument against a negative rate is quite inconclusive. But how about the concrete question? Is it conceivable that people would ever be willing to pay a premium for having present resources made available for the gratification of their future needs? From the point of view of the psychology of valuation it seems to me entirely conceivable. Certainly many individuals are so well provided with present means of gratification and so solicitous to make adequate provision for the future that they would gladly, *if this were the only way*, pay something to have a part of the superfluous wealth of the present made available to gratify future wants. In practice it is never, or almost never, necessary to accept negative interest, but why? Is it because the persons with a high impatience rate so largely predominate over those with a low impatience rate? Yes and no. Yes, because the chief source of the impatience for present income is the desire of business men for capital to use productively. Appreciation of the "technical superiority of present over future goods" is the circumstance that makes far-sighted, self-controlled persons with assured large incomes (who in Fisher's analysis are represented as savers and *lenders*), savers, to be sure, but also *borrowers*. It is their demand for the savings of others for use in business enterprises that causes the balance always to be on the side of a positive rate of interest.

<sup>8</sup> P. 93.

<sup>9</sup> *Rate of Interest*, p. 93.

And to prove that this is the case, it seems to me necessary only to isolate the factors which Fisher makes prominent by assuming this technical superiority of present over future goods to be miraculously absent. Suppose that the roundabout, capital-requiring method of production were *not* the more productive and that the determination of whether present goods should be preferred over future goods depended simply on the factors which Fisher enumerates. Would there be any conclusive ground under these circumstances for maintaining that preference for present gratifications is a "fundamental attribute of human nature"? With the best of will I can see none. It goes without saying that many people, with little foresight or self-control, would still be willing to exchange their prospect of future income for present gratifications. But even among poor people there are many with foresight enough and self-control enough to hoard from their scant incomes for the rainy day—witness the coin hoardings of the French peasantry which not only afford no positive return in interest but involve trouble, expense, and risk! Among people with larger incomes, some saving for the future, for old age, for children, for the social esteem, power, and influence which possessions give, would be the rule.

The aspect of the matter which Fisher seems to me strangely to overlook is the very limited borrowing power of the class of persons whose high impatience rates, according to his analysis, result in a substantial positive rate of interest. This comes out strikingly in connection with the assumptions which he makes and the conclusions which he draws from these assumptions in the development of the "First Approximation" in his *Rate of Interest* (ch. 7), which he repeats without material change in his *Elementary Principles*. His argument runs as follows:<sup>10</sup>

For the moment let us assume a perfect market, in which the element of risk is entirely lacking, both with respect to the certainty of the expected income-streams belonging to the different individuals, and with respect to the certainty of repayment of loans. In other words, we assume that all individuals are initially possessed of foreknown income-streams, and are free to exchange any parts of them, that is any present or immediate income for any future or remote income. Prior to such exchange, the income-stream is supposed to be fixed in size and distribution in time; that is, the capital instruments which the individual possesses are each supposed to be capable of only a single definite series of benefits contributing to his income-stream.

<sup>10</sup> *Principles*, pp. 389 and 390.

Under these hypothetical conditions, the rates of impatience for different individuals would become perfectly equalized.

For if any particular individual has a rate of impatience above the market rate, he will sell some of his surplus future income to obtain (*i. e.*, "borrow") an addition to his present meager income. This will have the effect of decreasing the desirability of his present income and increasing the desirability of the remaining future income. The process will continue until the rate of impatience of this individual is equal to the rate of interest. In other words, a person whose impatience rate exceeds the current rate of interest will borrow up to the point at which the two rates will be equal. Reversely, a man who, with a given income-stream, has a rate of impatience below the market rate, will sell (*i. e.*, "lend") some of his abundant present income to eke out the future, the effect being to increase his rate of impatience until it also harmonizes with the rate of interest.

Is the conclusion that under these conditions "the rates of impatience for different individuals would become perfectly equalized" justified? Clearly yes, as regards individuals whose rates are lower than the current rate of interest. They will continue to lend until the pressure of immediate needs, which even the veriest miser cannot entirely escape, will cause their impatience rates to correspond to the rate of interest. But what of those with high impatience rates—short-sighted, weak-willed persons, who are accustomed to spend, have no children to provide for, and have only a few years left to live? No one of the assumptions made appears to exclude them from the picture. In the aggregate in any actual society they constitute a vast army. As an extreme representative of this type think of the confirmed drunkard with a small but certain income. His craving for liquor is such that to obtain it he will sacrifice everything he owns or expects to own. *That* is the present gratification he wants and his impatience rate for it is 1,000 per cent. With his small, though regular and certain, income and his brief expectation of life, could he borrow enough to bring his impatience rate down to the level of the current rate of interest? Fisher says that "the chief limitation to lending is due to the risk involved, and to the difficulty or impossibility of obtaining the security necessary to eliminate or reduce that risk."<sup>11</sup> Is it not clear that the *chief* limitation is due, rather, to the small prospective incomes—aggregate incomes—of those who are most eager for present gratifications? Will Fisher maintain that the drunkard proposed for illustration has enough borrowing power to

<sup>11</sup> *The Rate of Interest*, p. 117.



bring his impatience rate down, say, to five per cent? If he is disposed to do so, may we not exaggerate still further the situation by having our bibulous friend condemned to a single year of life, or a single month, or a single week, with the small, certain income which limits his borrowing power correspondingly restricted? Or does Fisher mean to assume that the income of each individual is a perpetual stream independent of the continuance of his earthly life? If he does mean this I can find no hint of it in the text.<sup>12</sup> Moreover, it is an assumption so at variance with the facts of industrial society, where the vast majority of persons with high impatience rates are wage-earners with no incomes except those which come through their personal exertions, that it would deprive his "first approximation" of most of its value as a link in his explanation.

So far as I can see, with the technical superiority of present over future goods, or the productivity of capital, absent, the question as to whether interest would continue or not is an entirely open one. The factors on which Fisher relies for the "fundamental attribute of human nature" which causes interest, would, I am quite clear, not prevent many persons, with regard to part of their resources, from preferring to have them available in the future rather than in the present. On absolutely safe security they would lend, if they needed to, without any interest charge, to avoid the expense of hiring safe-deposit boxes in which to hoard coin or some other durable form of wealth. The number of persons who would lend without interest or hoard would be smaller no doubt than the number with positive impatience rates. But would the borrowing power of the persons with high impatience rates, limited as it would be in most cases by small present and prospective incomes exceed the lending power of those with negative impatience rates

<sup>12</sup> That Fisher ignores the effect which their limited prospective incomes have on the borrowing power of persons dependent on their own exertions is shown in the following sentences which refer to the actual industrial situation (*Principles*, p. 402). "Again, the second condition (that the degrees of impatience of all persons become equal to the rate of interest) may not be fully met; for a would-be borrower may not be able (owing to lack of security satisfactory to the lender) to secure a large enough loan to reduce his impatience to equality with the market rate of interest. Or he may be affected by laws restricting loans." Except for these limitations, the implication clearly is, "the degrees of impatience of all persons [would] become equal to the rate of interest."

many of whom would desire to leave large fortunes to their families, so that a positive rate of interest would necessarily result? The question is purely speculative and one man's guess at the answer is as good as another's but after squarely facing it can we concur in Fisher's view that "the preference for present over future goods . . . is a fundamental attribute of human nature"? Is it not rather a result of the present industrial organization of society arising chiefly from the fact that capital plays such a tremendously important role in production and that, under the system of private property in the instruments of production and free competition, capitalists can secure a return corresponding, at least roughly, to the part of the value-product that is economically imputable to the assistance which their capital renders? That is the view of the productivity theorists and it is now time to consider the cogency of Fisher's criticism of this familiar explanation.

Both in his *Rate of Interest* and in his *Elementary Principles*, Fisher criticises the productivity theory of interest. Since that is the theory which, on the whole, commends itself to my intelligence, I shall dwell on this part of his discussion at some length. The first criticism which he levels against this theory<sup>13</sup> is the one which is also urged by Böhm-Bawerk, that is, that advocates of the productivity theory confuse physical-productivity and value-productivity. That such a confusion has sometimes occurred I should be the last to deny. On the other hand, I cannot agree that there is no necessary or logical connection between physical-productivity *as a general phenomenon of capitalistic production* and value-productivity. The basis for Böhm-Bawerk's and Fisher's denial of this connection is the familiar principle that, other things remaining equal, an increase in the supply of any product depresses the price of each unit of that product with the consequence that a larger supply may have not a larger but actually a smaller aggregate value than a smaller supply. The application of this principle, so well established in economics with regard to an increase in the supply of a single commodity, to an increase in the supplies of commodities generally seems to me entirely unwarranted. Exchange values and prices are relations among goods. Increase the supply of one good and the ratio at which it exchanges for others or for money will change to its disadvantage. If, however, you increase at the same time the supplies of all goods, including gold, the stand-

<sup>13</sup> *Rate of Interest*, p. 12 *et seq.*

ard money material, you affect simultaneously both sides of all ratios of exchange and consequently the ratios should remain substantially as before. It is just such an increase of goods of all sorts and descriptions that is denoted by Böhm-Bawerk's phrase "the technical superiority of present over future goods" or by the more familiar phrase "the productivity of capital." Admitting the physical-productivity of capital (and Fisher does not question it),<sup>14</sup> the value-productivity of capital or more accurately an increase in the total value-product as a consequence of the assistance which capital renders to production seems to me to follow as a logically necessary consequence. The charge that advocates of the productivity theory take this connection for granted and nowhere prove it, is true only in the sense that it is such an obvious deduction from the accepted principles in regard to the determination of exchange values and prices that they usually assume express proof of it to be superfluous. Acceptance of this view does not, of course, carry one very far toward an understanding of the interest problem, but at least it suggests that the productivity theorists are not entirely on the wrong track.

Passing too readily from physical-productivity to value-productivity is, however, according to Fisher, not the major fallacy of which the productivity theorists are guilty. Just what this major fallacy is he tries to make clear by the following illustration:<sup>15</sup>

When the rate of interest is five per cent, nothing at first sight seems more obvious than that it is five per cent because capital yields five per cent. Since capital is productive, it seems self-evident that an investment of \$100,000 in productive land, machinery, or any other form of capital will yield a rate of interest proportionate to its productivity. This proposition looks attractive, but it is superficial. Why is the land *worth* \$100,000? Simply because \$100,000 is the discounted value of the expected \$5,000 a year. We have seen in previous chapters that the value of capital is derived from the value of its income, not the value of the income from that of the capital. Capital value is merely the present or discounted value of income. But whenever we discount income, we have to assume a rate of interest.

The fallacy of the productivity theorists is thus to try to explain the rate of interest by reference to facts which really presuppose the rate of interest to be explained.

<sup>14</sup> *The Rate of Interest*, p. 58. "Passing over the second step [that is, Böhm-Bawerk's proposition that the longer the average production period, the greater will be the product] to which no objection is offered."

<sup>15</sup> *Principles*, p. 366, *et seq.*

To the careless reader this sounds very just and very convincing. The more cautious will observe that its plausibility depends upon the dexterous putting forward of "land" as typical of all forms of capital. If land, the limited gift of nature, were truly representative of capital, then Fisher's reasoning would be unassailable. Since men could not increase nor decrease the supply of land, any value that it might have would be the discounted value of its products, and the circumstances determining the rate of interest would have to be sought in factors outside the field of production. But land is not representative of capital. If the reader will only substitute for "land" in the above sentences a phrase indicating the produced means to further production, he will at once see the hidden fallacy in the author's reasoning. We should then have: "Why are the tools and machines *worth* \$100,000? Simply because \$100,000 is the discounted value of the expected \$5,000 a year." If this were true then the chain of value causation would always be from the value of the product through the rate of discount to the value of the fund of capital giving rise to the product. That this is in fact the case is asserted by Fisher over and over again. But that it is not true admits of very simple demonstration. Change the expense of producing the tools and machinery that are worth \$100,000 and you will set in motion influences that will as surely change the value of the products, except in the rare case in which the production of the tools and machines is an absolute monopoly, as you would by changing the marginal utilities of these products or by changing the rate of interest. If, for example, the expense of producing the tools and machines is cut in two, the branches of production making use of them will be temporarily stimulated by the abnormally large profits to be secured, the cheapened tools and machines will be multiplied and presently the increased output of products will cause the value of the products to decline to conform to the reduced values of the instruments of production which give rise to them.

In other words, when capital is used in the sense of the produced means to further production, the relation between the value of capital and the value of its products is not one of simple dependence from value of products to value of capital, as Fisher represents, but one of mutual dependence. At the foundation of exchange values is, no doubt, as he argues, the principle that such values tend to correspond to marginal utilities. Also when the values to be

explained are those of instruments of production rather than of consumable commodities the marginal utilities of the commodities to be produced are, as he maintains, carried back by the discount process to the values of the instruments of production which give rise to them. What he overlooks is that these instruments of production are themselves produced and that in the expenses of production we have another factor of wide-reaching importance in the final determination of value relations. By this I do not mean to repeat the discredited proposition that exchange values are *determined* by the expenses of production. "It would be nearer the truth," if I may repeat what I have said in another connection,<sup>16</sup> "to say that prices, determined by the money equivalent of the marginal utilities of goods to marginal consumers, *determine* the expenses of production. But this statement also would fail to tell the whole truth. Prices are paid for goods because of limitations on their supplies. These limitations under conditions of free, all-sided competition are due in turn to limitations on the supplies of the factors of production. . . . Thus if prices determine the expenses of production, the causes necessitating expenditures in production play a part in determining prices. The chain of causation is not straight, but returns upon itself in a circle. Each influence that needs to be considered acts and reacts upon the others."

That is all very well, I can imagine Fisher rejoining. I may have been inadvertent in inserting that word "simply" in my demonstration, but what has your argument to do with my main contention, that is, that you productivity theorists lug in a rate of interest from the outside and imagine that by showing how it affects the value relations between capital and the products of capital you are explaining it? The answer to this question can best be given after examining the next step in his criticism.

In his *Rate of Interest*, and in abbreviated form in his *Principles*, he indicates his poor opinion of the productivity theory as follows:<sup>17</sup>

The futility of the ordinary productivity theory may be further illustrated by observing the effect of a change of productivity. If an orchard could in some way be made to yield double its original crop, the productivity of that capital in the physical sense would be doubled, but its yield in the sense of the rate of interest would not necessarily be affected at all, certainly not doubled. For the orchard whose yield of apples should increase from \$1,000 worth to \$2,000 worth would

<sup>16</sup> *Economics: Briefer Course*, pp. 203-204.

<sup>17</sup> *Rate of Interest*, p. 15.

itself correspondingly increase in value from, say, \$20,000 to something like \$40,000, and the ratio of the income to the capital-value, would remain about as before, namely, 5 per cent.

The first point in this statement that must strike the reader is that it characteristically takes for illustration not capital in the sense of produced means to further production but "an orchard" in which the "land" element is necessarily prominent. If he had taken freely reproducible tools and machines worth \$20,000 as the source of the products whose value is mysteriously doubled the improbability of the outcome he describes would be too obvious to escape his attention. What would happen in such a case, the production of the tools and machines not being monopolized, would be a multiplication of these instruments until the values of the resulting products were brought into normal relations again with the expense of producing them. Certainly the value of the tools and machines, in the absence of monopoly, would not be for any length of time doubled or even greatly increased, the limiting influence of the expense of producing them being readily brought into play. That such a change could not greatly increase the rate of interest, since its influence on the general capital market would necessarily be slight, the productivity theorist would readily agree.

Apparently Fisher was not altogether satisfied himself with this illustration for he goes on to say:<sup>18</sup>

One cannot escape this conclusion (as has sometimes been attempted) by supposing the increasing productivity to be universal. It has been asserted, in substance that though an increase in the productivity of one orchard would not appreciably affect the total productivity of capital, and hence would not appreciably affect the rate of interest, yet if the productivity of all the capital of the world could be doubled, the rate of interest would be doubled. It is true that doubling the productivity of the world's capital would not be entirely without effect upon the rate of interest; but this effect would not be in the simple direct ratio supposed. Indeed, an increase of the productivity of capital would probably result in a decrease, instead of an increase, of the rate of interest. To double the productivity of capital might more than double the value of the capital.

Nothing in Fisher's whole discussion better illustrates the disastrous results, so far as clear thinking is concerned, that follow the acceptance of his view that the "produced means to further production" and "land," the limited gift of nature, are essentially alike and should be thrown together under the common designation,

<sup>18</sup> *Rate of Interest*, p. 16.

“capital,” as a first step toward the solution of the interest problem! We are seriously asked to believe that by doubling the products that may be secured through the use of tools, machines, buildings, raw and partly finished materials, etc., we might more than double the value of these instruments! Is it not perfectly plain that after as before the change, time being allowed for an adjustment to the new conditions, the values of the produced means to further production will be brought into conformity to the expense of producing them? Since there is nothing in the assumption that the productivity of all instruments is doubled that involves any serious change in the expense of producing the instruments, the productivity theorist certainly *would* claim that under these conditions there must be, if not a doubling, certainly a very substantial increase in the rate of interest. Where, he may ask, does this large addition to the annual returns from the nation’s industries go if not to those who control the capital, which by hypothesis gives rise to it? And, since the expense of producing the needed complex of capital goods is little changed, must not the larger value return inevitably show itself as a higher rate of interest on capital? This is just the sort of illustration that confirms the productivity theorist in the faith that is in him, and I cannot think that Fisher has strengthened his case by referring to it.

This is not the place to attempt a complete restatement of the productivity explanation of interest. Various versions of it are available and a knowledge of the logical steps involved in it on the part of readers of this review may be taken for granted. Judging from some of Fisher’s criticisms, however, it clearly is the place to indicate briefly what this theory does and what it does *not* involve. It starts out with the proposition that entrepreneurs desirous of making profits by supplying goods at current prices compete against one another for control of the factors necessary to production. This competition tends to keep their own profits down to a large or small “wages-of-management” and to force them to pass along as the remuneration of the factors which they hire, subject to this deduction and to a deduction for the replacement fund, the total price which they receive for the things which they sell. It is, therefore, contended that it is the part these factors play in production as compared and measured by entrepreneurs that determines the shares of this total price that are assigned to them. The part that capital plays presents two aspects: that of

capital goods available at a given instant of time, and that of the purchasing power tied-up in these capital goods during the period that they are performing their productive function. In relation to the first aspect, entrepreneurs appear as buyers. Normally, under conditions of free competition, the prices which they must pay for capital goods conform to their expenses of production.<sup>19</sup> In relation to the second aspect, entrepreneurs appear as users of capital. How much interest they can afford to pay for such use, entrepreneurs estimate through comparing the productive services of capital goods at current prices with the productive services of workers, who at some points are interchangeable with capital goods, at current rates of wages. Through these comparisons the general rate of interest, so far as it depends upon the demand for capital for use in production, is determined. And it is this demand for capital growing out of the important role capital plays as a factor in production, that is the positive, active influence determining interest, in the same sense that utility may be said to be the positive, active influence determining value.

Productivity theorists do not claim that this is the whole story. They recognize the necessity of an analysis of the psychological factors that control the amount of saving and thus determine interest on the supply side. Neither do they deny that before an equilibrium is reached what Fisher calls the impatience rates and what Böhm-Bawerk calls the rates of discount of persons who save and lend—not of those who borrow and spend, as Fisher seems to think—must be brought into harmony with the rate of interest. As I have fully conceded in another connection:<sup>20</sup>

If men did not discount future goods, all incomes would be saved so long as interest could be earned in this way. That this does not happen is a sure indication of the truth of the principle upon which the exchange theory rests. It is equally obvious that whenever and as often

<sup>19</sup> In a complete analysis these “expenses of production” must, of course, be related to the “costs of production,” that is, the sacrifices which production entails for the marginal workers, on the one side, and the marginal savers, on the other. I am entirely unable to follow or to concur with the reasoning which leads Fisher to the conclusion that “all items of income and outgo cancel among themselves, except efforts and satisfactions” (*Principles*, p. 351). This outcome is the more surprising because the phrase “preference for present income,” which sums up his explanation of interest, itself so clearly implies the thought that waiting for future income involves a sacrifice.

<sup>20</sup> *Introduction to Economics*, p. 278.



as the current rate of interest exceeds the rate at which men discount future goods, income will be saved and invested and that the tendency in a competitive society will be for the supply of capital goods to be kept at just that level at which the rate of interest and the rate of discount are equal.

The decisive objection to Fisher's theory and theories like it, in other words, is not that they are not true, so far as they go, but that they are incomplete and inadequate because they fail to consider the other and more important side of the problem, that is the influences within the process of production which determine the share of the product to be assigned to capital and thus fix the value ratio between this share and the capital to which within a given period of time it is credited.

Fisher offers further refutations of the productivity theory, but a detailed review of them would bring out no new consideration of importance. They all seem to me to be either erroneous or to refer to forms of statement of the theory which are inaccurate. To the author's final conclusion that "the idea of raising the rate of interest by increasing the productivity of capital is, therefore, like the idea of raising one's self by one's boot straps,"<sup>21</sup> I can only reply that to my mind the idea of raising the rate of interest in any other way is like the idea of increasing the volume of a stream by changes, not in the capacities of its source or tributaries, but in the ocean into which it flows.

Although nothing in Fisher's discussion has shaken my confidence in the essential soundness of the productivity explanation of interest, when presented not as the complete explanation but as the necessary supplement of the discount theory, there is one feature in his treatment that leaves me uncertain how far he himself is a productivity theorist in disguise. I referred earlier to the importance he ascribes to the distribution of incomes in time as one of the factors influencing impatience rates. Consideration of this factor might lead the reader to conclude that its net influence on the rate of interest would be slight. Some persons look forward to diminishing incomes and their rates of time preference will be depressed thereby. Others expect their incomes to increase in the future and this will enhance their rates of time preference. In general, it might be thought that the two tendencies affecting different persons in opposite directions would, when these persons

<sup>21</sup> *Principles*, p. 369.

came to exert their influence on the rate of interest, largely offset each other. But this is not Fisher's opinion. Among the "Historical Illustrations" with which he fortifies his conclusions is the interesting example of the relatively high interest rate that has continuously prevailed in this country in comparison with the interest rates that have been current in Western Europe. The reason for this high interest rate is found by Fisher in the fact that American incomes generally are expanding rather than contracting. His exact account of the matter is as follows:<sup>22</sup>

In America we see exemplified on a very large scale the truth of the theory that a rising income-stream raises, and a falling income-stream depresses, the rate of interest. . . . In California, in the two decades between 1850 and 1870, following the discovery of gold, the income-stream of that state was increasing at a prodigious rate. During this period the rates of interest were abnormally high. . . . The same phenomena of enormous interest rates were also exemplified in Colorado and the Klondike.

In other words increasing income-streams may be a phenomenon in which whole communities share over a considerable period of time and its psychological accompaniment is a willingness to pay high rates of interest. But what do these increasing income-streams mean except that in the given situation capital is highly productive? Is not the real basis for the willingness of the people to pay high rates of interest under the conditions assumed their certainty that their investments will bring in big returns? Acceptance of this view is an endorsement of the productivity explanation of interest, and the illustrations given conform so exactly to this explanation that it is difficult to believe that their author is as unalterably hostile to the productivity theory as other portions of his analysis would seem to imply.

In concluding this criticism I should be less than fair if I failed to acknowledge the valuable service which Professor Fisher has rendered in subjecting current explanations of interest to searching analysis. Approaching the problem with the handicap of what seems to me a misleading rather than a clarifying concept of capital, he was predisposed to confuse the explanation of the returns to land, whose supply can be little affected through production, with that of the returns to capital, defined as the produced means to further production. The inevitable result, notwithstanding the acute thought which he has devoted to the prob-

<sup>22</sup> *Principles*, p. 405.

lem, is an explanation that is one-sided and inadequate. But when this is said, much that is favorable remains unsaid. No one can follow the development of Fisher's theory without gaining new insight into the interest problem or without feeling sincere admiration for the author's originality of expression, fertility of illustration, and boldness in following his reasoning to its logical conclusion. If his theory fails to displace the other theories already in the field, at least it must serve to stimulate the supporters of these theories to clearer thought and to a more careful formulation of their ideas.

HENRY R. SEAGER.

*Columbia University.*